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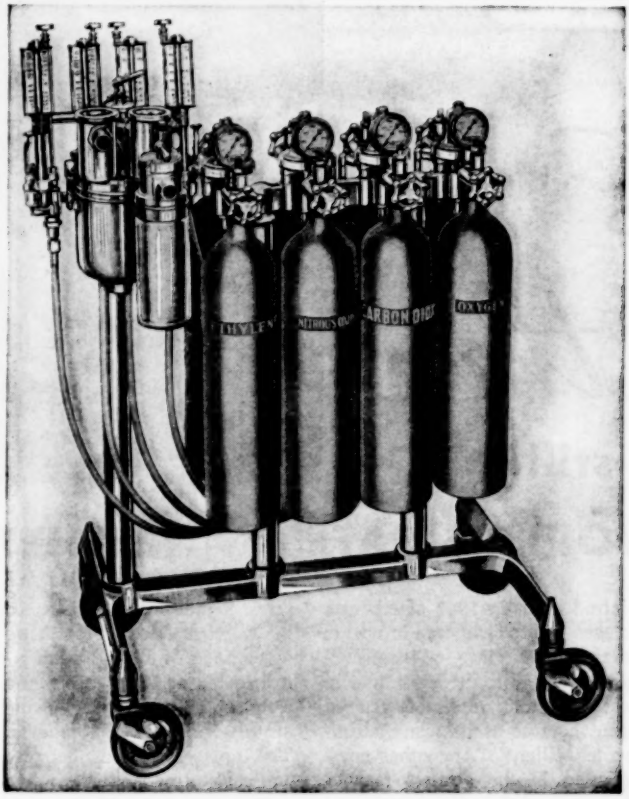

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* Anesthetics: "Their Relative Values and Dangers," Albert H. Miller, Rhode Island Med. J., 14: Spec. Supplement, Sept. 1931.

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Bulletin of the National Association of Nurse Anesthetists

VOLUME 4 NO. 2 MAY, 1936

INDEX

Anesthesia in Diabetes, I. C. Hanger, M.D. - - - - - - - 85

Forty Years Experience with Anesthetics, Moses Behrend, M.D. - - - - - - - - - - - - 90

Twenty-four Hours with the American Nurse in a Rural Mission Hospital, Myra L. Sawyer - - - - - - - 93

The Heart and Anesthesia, Sam Boyer, Jr. - - - - - - - 98

Anesthesia Problems, Archie D. Hobson, R.N. - - - - - - 103

Questions:

"What was the oustanding accomplishment in your department during the year 1935?" - - - - - - - - - 107

Replies: Alice M. Hunt
Hattie Vickers
Mary E. Koenig
Lou E. Adams
Mae B. Cameron
Olive L. Berger
Mary H. Muller

"Whose duty is it to see that the patient is placed in the proper position on the operating table—the nurse or the anesthetist?" - - - - - - - - - - - - - - - 111

Replies: Eva M. Dickson
Olive L. Berger
Mina Sponheim
Myrn E. Momeyer
Mary H. Muller
Miriam G. Shupp

In Memoriam, Sister M. Alexandrine - - - - - - - - - 113

Coming Meetings - - - - - - - - - - - - - - - - - - 114

Importance of Organization, Hilda R. Salomon - - - - - - 119

Officers of State Organizations - - - - - - - - - - - 121

Officers—National Association of Nurse Anesthetists - - - 123

Index to Advertisers:

Cheney Chemical Company - - - - - - Inside Back Cover

The Foregger Company - - - - - - - - - - - - - - 124

The Heidbrink Company - - - - - - - - - - - - - - 81

Ohio Chemical & Mfg. Co. - - - - - - Outside Back Cover

Puritan Compressed Gas Corp. - - - - - - Inside Front Cover

E. R. Squibb & Sons - - - - - - - - - - - - - - - - 82

The officers and Board of Trustees of the National Association of Nurse Anesthetists are happy to welcome to Cleveland the fourth annual convention of the Association, which will be held September 29th and 30th and October 1st, 1936.

It is their hope that together with the inspiration and interest of the meetings—happy occasions of renewing old friendships and making new friends, will come a deeper and more satisfying feeling of "belonging"—of coming home. For truly Cleveland, one of the great centers to first recognize nurse anesthetist service, the place of our organization meeting and National Headquarters, is HOME to our members.

May each convention day be filled with happy achievement and inspiration for better service.

ANESTHESIA IN DIABETES

I. C. Hanger, M. D.,
University Hospitals, Cleveland, Ohio

Prior to the discovery of insulin in 1922 by Banting and Best, 60 per cent of all diabetics were killed by anesthesia! This was not a voluntary suicide but an unavoidable death in diabetic coma. The anesthetic which the diabetics used on themselves was neither ether nor chloroform but was the acetone and similar products formed from the incomplete combustion of the fat in their own bodies. Before insulin, death almost invariably followed coma, and the poor diabetic did not fare much better at the hands of the anesthetist and surgeon, for even in the most skilled hands 80 per cent of all surgical diabetics died. No wonder the anesthetists and surgeons alike dreaded the diabetic patient and only the most urgent surgical problems were contemplated. Time and time again the giving of a few drops of any kind of anesthetic would start up an acidosis which in a few days would terminate in coma and death. Even today among the anesthetists, surgeons and the laity, we still find an indefinable fear of diabetic surgery, a hang-over of horrible pre-insulin experiences.

Many factors combine to make the diabetic a poor surgical risk. Williams[1] found pyorrhea in all but one of 78 adult diabetics. Ninety-six per cent of 850 of my patients when first seen showed varying degrees of diseased gums and abscessed teeth. Operation is frequently urgent, and in many cases there is not time to clean up this important source of bronchial pneumonia and lung abscess. Of 27 surgical deaths in our series 13 died of bronchial pneumonia, one of lung abscess.

The next factor of importance in surgical mortality is the age of operated patients (see Chart I).

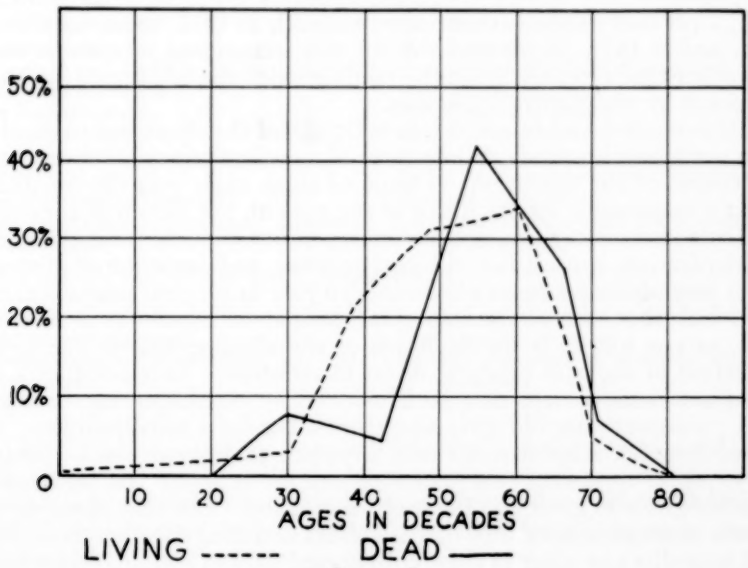

Chart I

AGES OF SURGICAL DIABETICS

Thirty-seven per cent of our patients were over sixty years of age at the time of operation; sixty-eight per cent were over fifty years of age. Diabetics tend to develop arteriosclerosis at a younger age than normal people and this rapidly increases with the duration of the diabetes. Old arteries all too frequently mean poor kidneys, poor heart, and poor cerebral vessels. It seems only fair for the anesthetist to know that almost all cases of gangrene have coronary disease. Wilder[2] found evidence of myocardial disease in 76 per cent of his cases of gangrene. All of our autopsied cases showed diseased coronary arteries, which no doubt accounts for part of our mortality.

Root and Sharkey[3] found 18 per cent of diabetics at autopsy have urinary infections. Myers[4] found 35 per cent of a hundred diabetics showed either clinical or laboratory evidence of liver damage. The diabetic shows an increased susceptibility to infections, especially if the diabetes is not controlled. Since the surgical diabetic frequently has infection and, temporarily at least, the diabetes is made worse following operative procedures, it is not surprising that the majority of post-operative deaths are due to infection.

Another adverse factor is obesity. I regret to admit that 76 per cent of our surgical diabetics are ten pounds or more overweight.

It has been estimated that one out of two diabetics passes through the hands of the surgeon before he dies. Not only is the absolute number of diabetics increasing but also they are living longer, and the longer the duration of the disease the greater is the percentage of surgical complications. Surgical problems such as gall stones, cataracts, abscesses, carbuncles, and gangrene abound in diabetics. It was hoped that insulin and improvement in treatment would lessen the incidence of surgical complications but figures taken from Joslin's hospical series show: in 1914, 2 per cent of the patients were surgical, in 1922, there were 18 per cent, and in 1933, 33 per cent. With this tremendous increase it seems important that the anesthetists be familiar with the additional problems presented by the patient's diabetes.

It is much easier to get the diabetic out of the operating room alive than out of the hospital. While three of our cases out of 315 died during the course of the operation, in none of these cases was the anesthetic directly responsible for the death of the patient, but although anesthesia has little immediate peril, one has an impression that the insidious effects of dehydration, nausea, fall in blood pressure, and depletion of glycogen stores seen after anesthesia play a hidden part in surgical mortality.

I feel that one of the important dangers of anesthesia is acidosis. This, as you know, is the depletion of the alkaline reserve due to the formation of the acid products of fat metabolism. That anesthesia can precipitate such a state may be illustrated by the following examples M. J., a sixteen-year-old girl, was given ether for a tonsillectomy. She roused from her ether narcosis only to return to diabetic coma. Fortunately, proper treatment was instituted and her recovery was uneventful. Another girl was given gas for tooth extraction. The next morning she became nauseated, sank into diabetic coma and died the next day. That such tragedies can occur in these enlightened days of insulin, drives home

the moral: "Never underestimate the seriousness of anesthesia to the diabetic." The pre-operative fast and post-operative nausea, together with the dehydration of anesthesia, make an ideal set-up for the development of diabetic acidosis.

When I contemplated preparation of this lecture, the similarity between the various stages of ether anesthesia and of diabetic coma suggested itself. To begin with, acetone, like ether, is partially excreted through the lungs. The other acetone bodies are excreted in the urine or oxidized in the body. Both substances are diffusible in the tissue fluids and have a quantitative correlation between blood concentration and clinical phenomena. A startling similarity exists between the action of ether and acetone bodies on the fat and carbohydrate metabolism as shown below.

COMA	ANESTHESIA
Effect on Carbohydrate Metabolism	
Glycosuria always	Glycosuria 12 per cent.
Blood sugar increases always	Blood sugar increases 98 per cent (Thorsen)
Glycogen formation ceases	Glycogen formation ceases
Glycogen disappears from the liver, skin and muscles	Depletion of glycogen present but less marked (Best, Hoet and Marles)
Lactic acid in the blood is increased	Lactic acid in the blood is increased
Insulin efficiency decreased	Insulin efficiency decreased to 1–10th
Insulin reaction rare	Insulin reaction rare
Effect on Fat Metabolism	
Acidity of the blood increased as measured by pH. (hydrogen iron concentration)	Acidity of the blood increased as measured by pH. (hydrogen iron concentration)
Alkaline reserve is diminished markedly as measured by the blood carbon dioxide	Alkaline reserve is diminished moderately as measured by the blood carbon dioxide
Blood fats, lecithins, and cholesterol increase	Blood fats, lecithins, and cholesterol increase
Acetonuria almost always	Acetonuria 88 per cent (Hamblen)
Clinical Effect	
Vaso-dilation present	Vaso-dilation present
Pulse increases	Pulse increases
Pulse feeble and rapid as death approaches	Pulse feeble and rapid as death approaches
Body temperature falls	Body temperature falls
Skin flushed and dry	Skin flushed and moist
Dehydration marked	Dehydration present
Nausea and vomiting the rule	Nausea and vomiting occasionally
Fall in blood pressure	Fall in blood pressure (after a period of time)
Deep respirations (Kussmaul)	Deep respirations
Onset marked by excitement, delirium, drowsiness	Induction excitement and delirium followed by drowsiness
Laboratory	
W.B.C. increased	W.B.C. increased in deep anesthesia
Specific gravity of urine and blood increased	Specific gravity of urine and blood increased
Renal function decreased	Renal function decreased
Increased excretion of chlorides, urea and phosphate	Increased excretion of chlorides, urea and phosphate
Albuminuria and casts always	Albuminuria 30 per cent, casts not uncommon

In the above analogy you will observe a fundamental similarity. This similarity would probably be more striking should the period of anesthesia be carried over a period of two or three days, when the marked clinical dehydration seen in diabetic acidosis would be more nearly approached.

The terminal picture of coma is almost identical with the fourth stage of anesthesia. The nausea and vomiting seen with induction of anesthesia reminds one of the pre-comatose stage of diabetic acidosis. In fact, the acetone bodies have successfully been used as an anesthetic but the toxic symptoms, together with the nausea, render them undesirable.

Now the usual question arises: "What is the best diabetic anesthetic?" At the present time I feel safe in stating that all anesthetics are bad for the diabetic, some worse than others, while some have less lasting effects. Ether is better than chloroform, as the latter has a more serious effect on fat metabolism and tends to destroy liver function. Ether has several disadvantages, among which is predisposition to acidosis. Every patient whether diabetic or not has some degree of acidosis in ether narcosis, and few surgical diabetics can assume any extra burden, especially post-operative acidosis. Ether prolongs the post-operative period of starvation and the sooner the diabetic can eat after his operation the less chance there is of severe acidosis developing. The loss of body fluids is no small factor to the diabetic. Ether while indispensable at times should be used as sparingly as possible. Be "Scotch" with your ether both in time and amount.

Nitrous oxide has less effect on fat and carbohydrate metabolism than ether, and while not free from faults is a most satisfactory anesthetic. Trout[5] has done considerable work on carbohydrate metabolism with ethylene. In the hands of experienced anesthetists, ethylene has been found by McKittrick and Root[6] more satisfactory than nitrous oxide. We have had no experience with ethylene anesthesia. Spinal anesthesia in theory at least is better than any of the above, but the psychic trauma and the difficulty of administration to the elderly diabetic with hypertrophic arthritis limit its use to some extent, and the fall in blood pressure and its bad effects on sclerotic coronaries and renal function makes me hesitate to advise its use in old people. The same is true of avertin. Amytal has undesirable effects on glycogen metabolism. Local anesthesia, in the absence of infection, is most satisfactory and has proved a great help in shortening the time period of general anesthesia.

Below I have summarized our surgical deaths and the types of anesthetics used and the duration of the anesthesia and compared it with a similar group who survived operation. While the small number of this series keeps one from drawing conclusions it can be seen that regardless of the type of anesthetic used the mortality was greatest where the operation was longest.

FIG. II

Type of Anesthesia	*No. of Anesthesias*	*Per cent of Mortality*	*Duration of Operation in Minutes*	
			Living	*Dead*
Gas-oxygen-ether	152	14	80	92
Nitrous oxide	89	10	51	89
Spinal	22	23	100	120
Local	52	6	65	97

In the Mayo Clinic where strenuous effort is made to shorten the period of anesthesia Fitz[7] found there was 36 per cent less ether administered, also that the period of anesthesia was 53 per cent shorter than a control group. Such effort was rewarded by a lowered surgical mortality.

The problem of insulin shock is a source of worry to anesthetists as well as surgeons. Fortunately this rarely happens, provided the operation has not been delayed too long after the pre-operative insulin has been administered. That low blood sugars can be masked during anesthesia has been demonstrated by Horsters and Brugsch[8]. But due to the diminished efficiency of insulin (estimated at 1/10 the usual efficiency) during narcosis, insulin reactions are extremely unusual. In fact, most authorities feel that insulin reactions are impossible when the central nervous system is not functioning. Even spinal anesthesia tends to ward off insulin shock.

Such is not the case, however, after the operation is over, and it is then that severe insulin reactions frequently occur. These are especially likely to occur during thyroid storms or after the drainage of a large amount of encapsulated pus. The routine giving of glucose after operations avoids this complication. I feel that many of the sudden deaths seen in diabetics, unexplained at autopsy, are due to the disastrous effect of hypoglycemia on sclerotic hearts.

Just what can the anesthetist do to help the diabetic's post-operative course? First, she can do much to allay the dread and fear of the coming ordeal. A diabetic submitting himself to operation not only has the usual worries that go with an operation, but also he realizes that he has an incurable disease which renders him susceptible to infections. Worry and fear rapidly deplete those precious stores of glycogen in his liver, skin, and muscles by stimulating his sympathetic nervous system. This of course renders him an easy victim to post-operative acidosis. Anyone who has cared for a large number of diabetics has seen the sudden appearance of sugar and acetone in the urine of a heretofore well controlled diabetic from psychic trauma. This is so striking that it formerly led many authorities to feel that worry was the cause of diabetes. Few clinicians today feel that fear plays an etiological role but that it can make a diabetic temporarily worse, few can doubt. If by their skill anesthetists can lessen nausea and vomiting, their diabetic mortality will drop. If they do all in their power to lessen the amount of anesthetic given, and the duration of the anesthesia, especially ether, many diabetics in the future will call them blessed.

REFERENCES

1. Williams: Am. Jour. Med. Sci., 182, 807, 1931.
2. Wilder: South. Med. Jour., 19, 241, 1926.
3. Sharkey and Root: Jour. Am. Med. Assn., 104, 2231, 1935.
4. Meyer: Arch. Int. Med., 47, 182, 1931.
5. Trout: Anesthesia and Analg., 8, Sep. & Oct. 1929.
6. McKittrick and Root: Diabetic Surgery., 82, 1928.
7. Fitz: Am. Jour. Surg., 36, 46, 1922.
8. Horsters and Brugsch: Arch. f. exp. Path. U. Pharm., 147, 13, 1930.

FORTY YEARS EXPERIENCE WITH ANESTHETICS

Moses Behrend, M.D.,
Jewish Hospital, Philadelphia, Pa.

In the report of the Board of Trustees of the Massachusetts General Hospital dated January 26th, 1848, there is found the statement that to W. T. G. Morton, D.D.S. properly belongs the honor of having introduced ether to the world. It states that operations were "performed with entire success on patients who had been rendered insensible by its benign influence. By overcoming all muscular and nervous resistance it has extended the domain of surgery, making operations possible which could not have been performed, and which would not have been attempted without its aid; and by the removal of fear of pain it has greatly increased the actual number of operations. It has already become an established remedy throughout all the chief cities of Europe and its benefits have reached even the distant natives of Singapore and of Canton." Such was the announcement two years after the discovery of ether. Ether was used primarily then for the extraction of teeth, the first major operations being performed by Drs. John C. Warren and George Hayward of Boston.

While nitrous oxide was discovered by Sir Humphrey Davy in the latter part of the 18th century, to Dr. Horace Wells of Hartford, Conn. (1844) goes the honor for its introduction to medical science. Shortly after the discovery of ether (1847) Professor Simpson of Edinburgh introduced chloroform.

Forty-nine years, to be exact, after the discovery of ether, I entered the Medical School of the University of Pennsylvania. At that time ether was extolled as the safest anesthetic. It can still lay claim to that attribute. It has retained this reputation to the present time. Little was heard then of nitrous oxide except for its use in the extraction of teeth. As a student I can well remember the brilliant exhortations of Dr. Horatio C. Wood, Professor of Therapeutics and Materia Medica in the University of Pennsylvania, concerning the effects of ether and chloroform. Here the sentiment against chloroform was so strong that Dr. Wood stated that should a patient die from its effects, doctors would be liable for suit, since instructions against its use and its attending dangers were universal in the medical schools of Philadelphia. This limited the employment of chloroform in the north. Chloroform, however, was largely used in the southern states and in countries near the equator, no doubt due to its lessened volatility in warmer climates. It was a useful aid to the obstetrician who employed it in the last stages of labor. The late Dr. Elwood R. Kirby, who was then teacher of anesthesia in the University of Pennsylvania, taught the use of ether only and explained its effects. Accordingly, ether was the universal anesthetic for many years. Personally I was never impressed with ether as the ideal anesthetic because its induction is usually accompanied with excitement, and its inhalation is most distasteful to the patients. During its administration there is always more or less secretion of mucus, which becomes very annoying. The recovery from its effects is prolonged as

compared with other anesthetics and subsequent nausea and vomiting are quite common.

Nitrous Oxide

The many objections registered by surgeons concerning ether stimulated the use of nitrous oxide after the first decade of this century, when it became exceedingly popular. While it was employed universally by dentists, and for operations of rather short duration, its use was not considered feasible in performing abdominal work on account of the lack of relaxation obtainable with this anesthetic. However, the amount of relaxation required to perform and complete abdominal operations depends entirely on the surgeon. I formerly used nitrous oxide exclusively for all abdominal operations including cholecystectomy, hysterectomy and others, for a period of at least fifteen years, to the time when the wave of enthusiasm for spinal anesthesia began to manifest itself. In the administration of nitrous oxide great care must be taken that a sufficient amount of oxygen is supplied. Patients may be asphyxiated easily with this gas, though I have never had a death from this anesthetic. I can make the same claim for the use of ether. The great advantage of nitrous oxide over ether is due to the fact that induction of anesthesia is quicker and the return to consciousness is almost immediate.

While nitrous oxide was being used by a great many surgeons, there was a desire to obtain an anesthetic in the category of this drug that would produce additional relaxation of the abdominal muscles. Great strides have therefore been made in the past two decades by the discovery and introduction of newer anesthetics for inhalation, as well as those used in local and rectal anesthesia. Among the most popular of the newer general anesthetics are ethylene, cyclopropane, and vinethene. It is a curious fact that the use of certain anesthetics becomes regional. In Philadelphia, for instance, ethylene has never been popular as an anesthetic, whereas in many surgical clinics ethylene has practically supplanted all other anesthetics. It is safe for the patient, and not too expensive, the only objectionable feature being that it is very explosive. With proper protection, however, the danger of explosion can be greatly minimized.

Cyclopropane, although introduced several years ago, never became popular until during the last two or three years. It is one of the safest anesthetics because 75 per cent of oxygen and 25 per cent of cyclopropane can be administered to the patient. Under its influence the patient is more relaxed than under nitrous oxide. In thoracic surgery it is ideal because so much oxygen can be used in its administration. In the Philadelphia General Hospital we have employed it in nearly a hundred thoracoplasties. While it is also explosive, and the initial cost expensive, the mixture of oxygen reduces the price per patient considerably.

Rectal Anesthesia

Anesthetization by means of drugs placed in the rectum was introduced in 1913. Rectal anesthetics have become a great aid in performing operations in the region of the head and face. The first combination to obtain recognition was ether in oil, introduced by Gwathmey. Its use never became popular, however, and the introduction of avertin has now almost displaced ether in oil. Avertin must be used with great care, in

not too large doses, because many fatalities have been reported. One must always remember that it is a basal anesthetic, and whenever necessary the use of the various inhalants is indicated.

Intratracheal Anesthesia

All anesthetics that are inhaled may be administered by means of intratracheal insufflation. This method was introduced in 1909 by Meltzer and Auer, but it has not attained the popularity that it deserves. It is useful in operations around the head and neck and neurosurgical procedures. It is attaining a wider field of usefulness now because of the stimulus given thoracic surgery.

Intravenous Anesthesia

While intravenous anesthesia was introduced many years ago, it never became a popular method on account of the danger accompanying its administration. Among these chloral was the first drug used, but here too many fatalities resulted. Evipal is now the most popular and safest drug to use, but it must be given slowly, otherwise its effects are dangerous.

Aids to Anesthesia

The various barbiturates have been given consideration in the past few years in the preparation of the patient for anesthesia. Drugs such as amytal, allonal and luminal, when administered the previous night or a few hours before operation, assist the surgeon when the patient is ready for anesthetization. These drugs, in the proper doses, have a quieting effect and help the patient to relax.

Local Anesthetics

For many years cocaine, introduced in 1887 by H. A. Kelly, was practically the only local anesthetic employed. Its poisonous qualities, however, when injected hypodermically, especially when used in the region of the rectum and other mucous membranes, made the discovery of another drug desirable which would not be so toxic. As a result, in 1905 novocaine was introduced. This can be administered in practically any dose for regional block, caudal, sacral, paravertebral and spinal anesthesia. The various methods have a field of usefulness depending on the lesion and location to be operated upon.

Spinal Anesthesia

Early experimental work in spinal anesthesia was done by Corning in 1884, but it was not introduced in practice until 1898, when Bier resorted to its use. This method did not become very popular, since it was followed by a number of deaths. About twenty years ago I witnessed two such deaths in the clinic of another surgeon, before the incision had been made. This experience of course had a restraining effect on my employing spinal anesthesia, since when once introduced it cannot be modified or recovered. In the past five years, due to the improvement in the drugs used and the perfected technique, I have employed spinal anesthesia very extensively. Its use has practically displaced all general anesthetics in my practice, especially in upper abdominal operations. I give preference to procaine hydrochloride, and have had no deaths resulting from its use in about 3000 cases. I consider it a safe method provided the cases are properly selected.

This paper is a brief review of the history of anesthesia and the writer's experience with anesthetics for nearly a half century.

TWENTY-FOUR HOURS WITH THE AMERICAN NURSE IN A RURAL MISSION HOSPITAL

MYRA L. SAWYER,
Tehchow, Shantung, China

Tap-tap at the door wakens at one in the morning! "An emergency obstetric case, Miss Su. The patient is a primipara and has been in the hands of native midwives (so-called) for two days. A hand is protruding. We will get everything ready in the delivery room, and will call you again when it is time to give the anesthetic." "Thank you, Miss Liu. How is the strangulated hernia patient we had last evening?" "He is resting quite comfortably, and his pulse is much better force since his saline-glucose infusion."

A little after four the "superintendent-chief supervisor-anesthetist-instructor" turns in again for a brief nap before the day's duties begin. All possible has been done to safeguard the life of that young mother, including a prophylactic shot of antitetanus serum. Now one can only trust to nursing care and Mother Nature to heal those extensive lacerations made by well-meaning but ignorant hands in the village home. One breathes a prayer of thankfulness for the schools of midwifery that are just being started in strategic centers, whose graduates will in due time displace these native midwife-hags, whose long finger nails are their most convenient instruments, because always at hand, and whose kit of tools a plumber would scorn to use. Cruel, you say? Yes, but not intentionally so. It is ignorance, and one finds that in the homes of rich and poor alike, in the lands where Western medicine, hygiene, surgery, and prenatal care are just penetrating.

Brrrr!! the six o'clock alarm and the beginning (?) of another day. The cheerful chatter of the pupil nurses down in their dormitories mingles with the sound of Baby Hou's prattle over on Ming-Hu porch, and that of a flute played by one of the men nurses as he takes an early morning stroll up on the compound dike. Breakfast over, a swift look at two or three of the most serious cases, a few directions to Carpenter Wang and Painter Wu, and it is time for nurses' roll call and the formal reports from the night nurses. Supplies for the day are issued to the various ward units and to the native sewing women. The requisition for drugs from the main stockroom is filled for the pharmacist. An eye in the operating room is necessary for that toxic patient with a malignant growth of the breast who is to be done under scopolamine-morphine analgesia, with a very little chloroform for the skin incision, and again during the closure. With carefully adjusted, comfortable restraining bands, this anesthesia will be wholly satisfactory for the surgeon, and the patient will come through much better than if she were to be given two hours of ether.

This woman weighs 130 pounds. The usual pre-operative procedure of forcing water every half-hour on the day preceding operation, there having been no special contraindications, has been followed. She has also been given three doses of soda bicarbonate during that day, and simple meals, with extra rations of sugar. Castor oil was given in the early afternoon, followed by an enema in the evening, and another enema

at daybreak. She was brought to the operating room at 7:15 a.m. and given 1/6 grain of morphine and 1-100 grain of scopolamine by hypodermic. She was instructed not to talk, a pad was put over her eyes and the room kept quiet from then till her operation. A nurse stays with her, recording the pulse every thirty minutes and the respirations every ten minutes. The second hypodermic is given in one-half hour. This time it is 1/8 grain of morphine, with 1-200 grain of scopolamine. In another half-hour, if the reflexes are still active and the respirations satisfactory, this latter dose is repeated. An emaciated patient, or one who quiets readily under two doses, or one whose respiratory rate is below sixteen per minute, is carried without the third hypodermic. The patient is ready for operation by 8:15 a.m. The restraining bandages are adjusted before the first hypodermic is given. The site may be prepared for operation immediately after the last injection. At the close of the operation a retention enema is given of saline soda bicarbonate solution with the patient in Trendelenburg position. One of the advantages of this anesthetic is that the sphincters are not relaxed and the enema, properly given, will be retained and afford a greater degree of post-operative comfort. The patient awakens gradually on the ward, with no memory of procedures after the first hypodermic, and with little or no nausea.

Seeing that all is going well with this patient, the nurse returns to the main floor corridor and takes her seat at the piano for the twenty-minute chapel service, which is a part of a mission hospital routine and privilege. The staff take turns in leading this meeting and all attend with the exception of one nurse on each unit, unless abnormal needs demand more than this number. Chapel over, if it is one of the three regular operating days of the week, the surgeon and his assistant go to the operating room and the other doctors to the wards for rounds and dressings. The writer gives all the general anesthetics and keeps an eye on the senior pupil scrub nurse and the junior assistants. Fortunate are we to have capable Dr. Tsuei as surgeon, graduate of the University Hospital four hundred miles to the south, to whose clever fingers and quiet poise many thousands have owed their lives in the eleven years he has been with us.

"What sort of operations do you have?" you ask. Most of the cases you meet at home, except that in so many instances they come in very advanced stages. This is partly because the patients may not know of the Jesus Hospital where surgery is possible, or from ignorant fear of Western methods, or because (again ignorantly) the crops were being harvested and the animals and carts too busy to bring the patient, or the busy house mother waited until she was utterly incapacitated for work before she sought relief. Tumors which would be removed when the size of walnuts in America are often the size of watermelons when we get them. Innumerable wars and ever-present banditry bring their train of gunshot wounds. The bitter water, laden with alkali, is the prolific cause of stones in the bladder, ranging from the size of a large grape to that of a good sized peach. Picture the relief from such agony as these produce in tiny tots as well as in adults. Medical cases have been slower to adopt Western methods of relief, but their numbers increase year by

year. All the diseases known at home are seen, and some peculiar to the Orient, as amebic dysentery, typhus, malaria, kala azar, hookworm, et cetera, plus, of course, all the contagious diseases known to mankind, in regions where the prevention of such is just being undertaken.

The times that have proven most free for class work are from eleven to twelve, the hour after lunch, the last two hours in the afternoon, when the outpatient clinic is over, and an hour in the evening. As far as possible we give the evening hour to the Chinese doctors for their classes in anatomy and materia medica, for wise is the American nurse if she plans her teaching so she can "go to bed in English!" So, operations over, the hour before lunch is occupied with demonstrations in special surgical technique. On other days it might be any of the various classes in practice and theory with which you are familiar, *but* all in Chinese! Precious indeed are the pictures of procedures in one's English textbooks, and many are the additional translations one must make from the texts.

As I pass through the women's wards on my way out for lunch I pick up the latest ward pet and take him along in my riksha for his daily treat. It has been a hobby for many years to always have a waif baby growing up in the women's wards, as a practical demonstration for the pupil nurses, and the women in the beds, in the care and feeding of a *well* baby. Incidentally they have been a great joy to the mother-heart within me. Sometime before their third birthday a happy adopted home has been found for each one, and another occupant for the vacant rocker and crib smiles his way into our hearts.

Had you visited the wards after dressings were done this morning you would have found sweet-faced Mrs. Wang, the evangelist, sitting between two beds, with one or two convalescents in wheel or invalid chairs nearby, eagerly listening to simple Bible stories or learning to read from the "thousand-character" charts that hang on the walls. As she talks, nimble fingers are making dainty paper flowers of white and yellow tissue paper, for soon will come the "Jesus come to Life" festival, and Miss Su will need many of these flowers to help decorate Porter Chapel for the big meeting. Thirty odd little kindergartners have been practicing a motion song for that service, and the nurses' glee club is rehearsing two lovely anthems.

At 2:30, just as Miss Su is finishing a lecture on cerebro-spinal meningitis, pointedly chosen for this time, as an epidemic of the same is raging in the city, a call comes from the out-patient department for help with a would-be suicide. The unhappy daughter-in-law, in an effort to wreak vengeance on her in-laws, and call down sympathy for herself, has taken a potent mixture of matches soaked in water, drinking the resulting phosphorus solution and chasing it with a large swallow of kerosene. It is several hours since the deed was done, as she lives fifty miles away and has come by a slow farm cart. Speedy and thorough lavage is given, the indicated medicinal antidotes administered, forced fluids ordered, and the wretchedly uncomfortable victim put in a warm, clean bed. If nephritis does not develop within the next few days she will probably come through all right. Not so, alas! the man who, a few days previously, yielding to the temptation to unlawfully use monies belonging to his firm, on discovery of the theft took a handful of heroin

tablets. Many hours of artificial respiration failed to revive him, and one more was added to the long list of opium victims. "Heroin cigarettes" are becoming more and more a vicious habit-forming and life-destroying menace, introduced into China by a neighboring nation.

The afternoon clinic runs until five. The cart shed and hospital compound are filled with country carts, wheelbarrows, rude litters, babies in baskets, donkeys, rikshas - all the various means of "ambulance transportation" found in a rural community. This hospital has one hundred beds and serves a clientele of three million, the only dispenser of Western medicine and surgery for two hundred square miles. Smallpox vaccination is being given free this week to all babies under six months (for purposes of propaganda), and at cost to all older. So Miss Su and several pupils are caring for a queue of squalling candidates in an orderly sequence of procedures. Admissions to the hospital are usually made via this clinic, though emergencies are received at any time. Patient Mrs. Wang again to the fore, here in the clinic, soothes, counsels and comforts, bringing order out of chaos. Many of these women have never before been outside their home village, and often have I had to ask their carter the name of the village from whence they came, and the full name of the husband, for the wife speaks of him only as the "father of the children." Mr. Fan, over in the men's clinic, likewise meets the men and wins their friendship. The men are always more open-minded, by reason of their greater opportunities for contact with the outer world.

As I leave the clinic, Dr. Han is looking for me to report the admission of a young man with a tumor of the neck half the size of his head. "Will you arrange for him to have colonic ether day after tomorrow, please, Miss Su?" So for the last class of the afternoon I call the seniors, and go over with them the details for the preparation, assigning to one of them the responsibility for carrying out the orders in cooperation with the night nurse on the floor, as follows:

The day before operation—Bed bath in the morning; skin preparation in the afternoon; forced fluids every half-hour. 2:00 p.m. Castor oil, one and one-half ounces; 5:30 p.m. semi-liquid diet; 8:00 p.m. soap suds enema; water every hour during the night, when awake, till 4:00 a.m.

The day of operation—5:00 a.m. Soap suds enema; 6:00 a.m. Saline enema. On completion of this leave in a rectal tube inserted six inches, to ensure an empty bowel. Dress in operating room clothing, and have the patient lie on the left side with knees flexed, and the foot of the bed raised on six-inch shock blocks. Cover the eyes, and instruct both patient and nurse not to talk.

For an 8:45 a.m. operation—6:30 a.m. Chloretone, 10 to 15 grains (according to the weight and age of the patient) dissolved in two drams each of ether and olive oil; injected through the rectal tube; 7:00 a.m. Morphine, 1/6 to 1/4 grain, Atropine, 1-100 grain; 7:45 a.m. Ether-oil mixture. Give very slowly through a funnel and two feet of tubing attached to the rectal tube. When completed, clamp the tube and leave in place; 8:25 a.m. Send patient to the operating room, disturbing as little as possible; 8:40 a.m. Prepare and drape the patient. One of the surgeon's assistants or the anesthetist must be responsible for the patient having a clear airway as in any general anesthesia.

Ether Oil Mixture. One ounce for every twenty pounds of weight, of a 60 to 75 per cent mixture, never to exceed 6 ounces if the latter strength is used. For a woman in fair health, a 65 or 68 per cent mixture is usually sufficient. A muscular, well-nourished man might require from 70 to 75 per cent mixture, never to exeed 6 ounces if the latter strength is used. The very weak, toxic patient is no more fit subject for colonic than for oral ether. Anything less than a 60 per cent mixture will not carry a patient through an operation without a supplementary oral anesthetic, which defeats the main object of colonic anesthesia—to do away with the necessity for having a cone on the face. The criticism often heard is that it requires too detailed preparation. My answer is that it is not worth trying unless it is properly given. If the solution is too weak it will not put the patient to sleep, and if the patient is poorly prepared he will not retain the enema. In twenty-five years of experience the writer has never had a failure or any untoward results. When the patient is returned to the ward the colon should be irrigated with lukewarm saline and soda-bicarbonate solution until the return is free from ether or oil, when the original rectal tube may be removed.

This class over, a brief interview with two well-meaning but rather rash young student nurses, who promise better things for the future, and then off for that coveted quiet stroll to supper, via the dike surrounding the compound. From this vantage point one may enjoy the sunset, the shadows across the wheat fields, or the creak of the wheelbarrows on the market road below, as farmers return home from selling their produce at the fair. After supper a few minutes over that fascinating jigsaw puzzle, spread out to entice, and then back to the organ in the chapel for practice with the nurses on their Easter anthems. A last visit to the sickest patients, a few final directions to night nurses, and the American nurse is free to study, write letters to the home clientele to ensure those precious gifts which mean open or closed doors for these needy sick folk, read that last nursing journal, turn on the victrola—or go to *bed*, if and providing no emergency case arrives to interfere. Her last waking thoughts are a jumble of the "undones," of the two nurses who are to receive baptism and church membership on the coming Easter, both from non-Christian but fortunately not anti-Christian homes, and the prayer from a thankful heart for the chance to serve this day—together with the swift hope that no babies or bandit victims will *need* to come before morning, but that if they *do*, they will come *in time!*

Note: It will be evident that this is a picture of a district where it is impossible to secure nitrous oxide and oxygen for gas-oxygen-ether anesthesia, hence A.C.E. or chloroform inductions, ether, spinal, hyoscin and colonic general anesthesias, caudal and local, each in its place, must suffice.

THE HEART AND ANESTHESIA

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I wish to thank you for giving me the opportunity to talk to you today. Before proceeding further I warn you to bear in mind that I am not an anesthetist. I believe that I am correct in assuming you all to be graduate nurses who, because of your ability and interest, have been chosen or have chosen to study and administer anesthetics. Naturally enough you are not trained physicians, but being of scientific bent you are not only interested in the anesthetics you administer, but I believe also in what is occurring in the body of the patient while he sleeps before you. Let us then, before discussing anesthetics and their effect upon the heart, say a few words about the anatomy and physiology of the heart and of the types of heart disease.

The heart, as you know, is the most important muscle of the body, and is divided into four chambers which we term the right and left auricles and the right and left ventricles. The auricles are separated from the ventricles by valves; that on the left being known as the mitral, and the one on the right as the tricuspid. The blood issuing from the heart into the aorta passes through the aortic valve; that emptying from the heart into the pulmonary artery to the lungs goes through the pulmonary valve. The muscular portion of the heart we term the myocardium; the inner lining, the endocardium, and the outer lining, the pericardium. The latter in turn reflects back and forms a sac within which the entire organ lies.

In the wall of the right auricle, near the openings of the two vena cavae, lies a small specialized area which is called the sino-auricular node. At the base of the septum dividing the two ventricles, and immediately adjoining the auricles, is another specialized bit of tissue which we term the auriculo-ventricular node, and spreading out from this through the mass of ventricular muscle is a tree-like bundle of specialized tissue which we know as the auriculo-ventricular bundle, or the Bundle of His. We shall say more about this important architecture later. The heart is innervated by two systems of nerves. The one is composed of branches of the vagus nerve, having its center in the brain and stimulation of which will cause slowing of the heart. The other system of nerves comes from the sympathetic nervous system, and, although it has never been isolated, its center probably likewise lies in the brain stem. Stimulation of this system will result in acceleration of the heart. Likewise, depression of one or the other system will allow the opposite group of nerves to exact its control.

The heart beat originates in the sino-auricular node and then spreads through the auricles in a manner comparable to the ripples created by throwing a stone into a placid pond. When the impulse reaches the auriculo-ventricular node, it in turn is carried through every part of the ventricles by the far-branching Bundle of His. The heart beat originates within the heart, but is controlled as to rate and probably force by the sympathetic and vagus nerves. The force and rate of the heart beat is

also controlled somewhat by the concentration of various ions such as calcium, sodium, and potassium. Therefore we may say that the heart is a specialized muscular chamber whose function it is to force blood through the body, and which possesses the special qualities of irritability, tonicity, conductivity and contractility.

We may have disturbances of the various parts of the heart. Thus the pericardium, myocardium, or endocardium may be involved. Often, but not always, there is involvement of all parts at the same time. Likewise, there may be disturbances in the origin of the heart beat and in the conduction system, so that as a result, we have disturbances in the regularity or rhythm of the heart.

In considering the heart and anesthesia, we must of necessity consider heart disease. There are, as you all know, various types of heart disease, and these types may affect individuals at different ages. The types of heart disease which we consider and classify and the age group at which they occur are: Congenital heart disease, naturally making its appearance at an extremely early age in the vast majority of cases and seldom seen later than the end of the second decade; rheumatic heart disease, which is extremely prevalent and which is most common during the second decade; bacterial endocarditis, which we may omit in considering anesthesia, is an acute or subacute infection of the heart. Syphilis of the aorta and heart occurs usually after the age of forty; hypertensive heart disease occurs mostly in the fourth and fifth decades, as does coronary disease. Finally, the heart may be affected by thyrotoxicosis and the acute infections.

A patient may have an enlarged heart with involvement of various valves and resultant murmurs and thrills, but still never be aware of the fact. Again, an individual may have high blood pressure or coronary disease and have no idea that his heart is diseased. We then speak of the heart as being diseased, but being in a state of good compensation. In other words, the heart is able to do the work which that individual places upon it, without in any respect failing or showing signs of its failure. However, there comes a time in the life of the individual with a poor heart when he notices that on climbing stairs, going up a hill or in other ways exerting himself, he becomes short of breath, his heart beats rapidly and perhaps he notices that it is irregular. He then observes that his ankles swell a little at night, perhaps there develops a slight cough, his appetite fails, he may become nauseated and he may even vomit. These are signs of failing ability of the heart to do the work which it is called upon to do. This we term decompensation.

I have no doubt that what I have said is entirely familiar to you, but a review of certain facts is always of extreme value, and of particular value in what I will say later. So, if I seem to have reverted to the primary grades of your nursing education, I hope you understand and will pardon me.

Anesthesia may be defined as a local or general body state of unconsciousness produced by the effect of certain drugs upon the nervous system. Anesthetics may be divided into two broad classes, the local and general anesthetics. Because we know that generally local anesthetics place no load whatsoever upon the heart we shall omit any dis-

cussion of them with the exception of spinal anesthesia, which is to all practical purposes a local anesthesia. The general anesthetics may be divided into the inhalation and non-inhalation types. The former group may in turn be subdivided into the irritating and non-irritating anesthetics. Included among the former are chloroform and ether. Among the latter are nitrous oxide, ethylene, and of late interest, cyclopropane. The non-inhalation general anesthetics include such things as evipal, sodium amytal, nembutal and other allied drugs. I do not choose to discuss this group of drugs as anesthetics because I feel that any drug which is given intravenously escapes from control and the anesthetic cannot be modified by withdrawing the drug. Broadly speaking, the barbiturates in general when given in anesthetic doses lower the blood pressure and increase the pulse rate, which with depression of respiration are deleterious to a diseased heart.

Spinal anesthesia produces a lack of sensation and muscular power, depending upon the size of the dose administered. The vessel tonicity in the area anesthetized is lost; as the dose is increased the intercostal muscles, big factors in respiration, fail and finally, if the dose has been huge, the diaphragm, the all-important muscle of respiration, is paralyzed and the patient is in a critical condition. Waters and Seivers have shown on dogs that if artificial respiration is applied, the patient can be kept alive. The expansion of the chest and the piston-like action of the diaphragm are aids in returning blood from the body to the heart. With an impairment in this action there is more stasis of blood in the vessels in the affected area, which have already become dilated and toneless. This results in two conditions: the one is a lowering of the blood pressure and the other is a decrease in the amount of blood entering the heart and therefore a decrease in the output of blood from the heart per minute. Again, these factors have another effect and that is a state of tissue anoxemia. You can readily see that if a patient has a high blood pressure, reduction in this pressure by spinal anesthesia will result in defective circulation through certain parts of the body, with tissue damage because of anoxemia. If the action of the intercostals and diaphragm is impaired and the heart is already diseased, there will be placed upon it a greater load than upon a normal heart, since the minute volume output of a diseased heart is less than a normal one. I would say then, regarding spinal anesthesia, that it should not be used in cases of hypertensive heart disease or in chronic nephritis with hypertension. If the patient has a diseased heart from another cause, spinal anesthesia should be used only in selected cases, where the dose administered is small, so that there will be no interference with the return flow of blood to the heart by paralysis of the muscles of respiration. If the latter should happen to a patient whom you are attending, remember that artificial respiration, ideally but impractically in a Drinker respirator, will tide the patient over until the function of these muscles is restored. Practically, artificial respiration with undiluted oxygen is of the greatest value.

We may dismiss chloroform with a few brief words. Years ago chloroform was the anesthetic of choice, but with the passage of time it has been relegated largely to the background. We know now that chloroform is a direct poison to the heart, weakening its action and

resulting in fatty degeneration of the heart and other organs. It may by vagus stimulation cause a marked slowing of the heart, or in turn it may result in various arrhythmias which may be detrimental. With the advent of other anesthetic agents which are less detrimental, chloroform, otherwise satisfactory, has been discontinued.

Ether is an irritating anesthetic which when first administered causes definite irritation of the upper respiratory tract with reflex stimulation of the accelerator center and vasoconstrictor center in the brain, resulting in a faster heart beat and increased blood pressure. As the anesthesia passes the stage of irritation, the pulse and blood pressure fall somewhat but are maintained at a level above normal. Muehberg and Kramer showed that intravenous injection of ether in a dog would stimulate the vasoconstrictor and vagus centers, producing an elevation in peripheral resistance and a slowing and weakening of the heart, which factors in turn result in dilatation of the heart. This often happens practically in laboratory animals, but as far as is known never in man, probably because the irritating effects of ether make it impossible to administer it fast enough to bring about this result.

Nitrous oxide and ethylene are the two available non-irritating drugs. Both of these must be given in higher concentration than chloroform and ether. Nitrous oxide must be given in a ratio of 95 parts to 5 parts of oxygen to produce anesthesia. This of course results in anoxemia and cyanosis. For this reason it cannot be administered for long periods of time without producing asphyxia, although combined with preanesthetic drugs sufficient oxygen may be included for light surgical anesthesia. The state of anoxemia and asphyxia is harmful to a damaged heart muscle, which itself requires all the oxygen it can get. As the tissues and respiratory center become anoxemic the heart attempts to compensate by accelerating and sending more blood throughout the body. This constitutes overwork and may result in further cardiac damage. Ethylene may be given with larger quantities of oxygen, 80 parts ethylene to 20 of oxygen, but by stimulation of the vasoconstrictor center there often results a temporary marked elevation of blood pressure, with a secondary fall, but at a level still above normal. Of the anesthetics discussed, ether and the latter two gases kill by respiratory paralysis, while chloroform first attacks the heart and produces death usually by this route.

Much has been said and written regarding the work imposed upon a heart during anesthesia and a surgical procedure. Surgeons undertake major operations upon cardiacs with fear and trepidation. It is true that during such manipulations under anesthesia there may occur various abnormalities in rhythm, but by and large these are transitory affairs and do not last long. You are entirely familiar with the danger signals presenting themselves during anesthesia, namely, rapid, thready pulse, a fall in blood pressure, cyanosis, a leaky skin and disturbances in respiration. Are these manifestations of cardiac damage due to the anesthetic? I think not. It is generally accepted that the state of surgical shock is not due to heart disease and it is known that it occurs in individuals with normal hearts as well as in those with heart damage. Loss of quantities of blood during surgery is another important occurrence. Both of these

states may and often do present the above mentioned symptoms. During recent years there have been numerous statistical surveys comparing the mortality in cardiacs and non-cardiacs undergoing anesthesia. Sprague contends that patients with normal hearts are more apt to die suddenly under anesthesia than those with diseased hearts. Butler and his co-workers in Boston are of the opinion that in most types of heart disease the risk is not appreciably greater than it is in the normal person. These workers observed that of 414 patients with heart disease the mortality from the standpoint of unexpected death was 6.3 per cent. The highest mortality was in coronary thrombosis and second in patients with congestive heart failure. The conditions which one must particlarly fear are coronary thrombosis, congestive heart failure and luetic aortitis. Sudden death in these conditions may occur during anesthesia.

I feel that the answer to the question as to what dangers exist in operating upon a patient with a diseased heart and whether he will bc able to stand the strain of an operation and anesthetic, lies in the close cooperation of surgeon, internist, and anesthetist. The surgeon in the first place must answer satisfactorily these two questions: Is this frankly an out and out surgical condition?; and secondly, Is this a surgical procedure which is absolutely necessary? Diagnosis is rapidly improving and less frequently, though still occasionally, we find the surgeon opening an abdomen when the true condition is a medical affair. The second question must also be considered. If the patient has heart disease do we want to run the possible risk of ending that patient's life unduly soon by performing surgery with which he could dispense? In other words, should a surgeon repair a hernia in a patient suffering from severe heart disease? When the patient is on the operating table the surgeon may again cooperate by doing his work thoroughly but as rapidly as possible, for we know that the longer the anesthetic the greater the risk. The internist comes into the question in pre-operative diagnosis and care. If the patient has heart disease but experiences none of the symptoms I have mentioned above, *i.e.*, shortness of breath and rapid heart upon exertion, swelling of the ankles, cough, or other symptoms of impaired cardiac reserve, the internist may safely say that here is a fair risk. However, if these symptoms do present themselves the internist should feel that the case at hand is a poor risk. In such an event adequate medical treatment with rest, digitalis and other supportive measures as needed should precede surgery. Proper pre-operative treatment is imperative in such an individual and will do much to lower the risk. Occasions arise when emergency surgery in such individuals is imperative, but on such occasions it is necessary to make the best of a bad situation.

The anesthetist is called into the picture during the procedure, first, by the smoothness with which she can produce a state of anesthesia. It is evident that if the patient is forced to sleep, if the anesthetic is given too fast, the patient will struggle, retch, perhaps vomit, and there will be excessive bronchial secretion. These actions constitute a load upon the heart and with an existing state of poor compensation may be enough to produce a frank state of decompensation. The anesthetist should follow the patient's condition closely and if she observes any of the danger signals she should not hesitate to inform the surgeon of these facts.

Again, if any untoward signs present themselves in a patient with heart disease, it might behoove the anesthetist to kick the surgeon's shin and warn him to *step on it*. There is as much difference between well administered anesthetics and poorly done work as there is between a pleasant, restful sleep and a sleep fraught with nightmares and tossing about.

You ask me what anesthetic is the agent of choice in patients with heart disease? I feel that induction of anesthesia with ethylene, thereby producing a smooth, easy, pleasant state of anesthesia, followed and supplanted by ether, is the method of choice. Spinal anesthesia because of its effect on blood pressure is not as safe. Nitrous oxide produces too high a degree of asphyxia.

In summary, let me state that patients with heart disease are almost as good a risk as normal persons providing:

1. That the heart is in a state of good compensation and there is adequate cardiac reserve.
2. That sufficient pre-operative treatment has been followed if necessary.
3. That the surgical procedure is not too long.
4. That the administration of the anesthetic is skillfully and adequately given, with as little distress to the patient as possible.

I do not want you to think that I look upon diseased hearts lightly and without risk in surgery and anesthesia. I honor them and fear them. Let me give you in closing the words of Dr. Ochsner before the College of Physicians of Philadelphia in 1902. "I think it would be unfortunate should surgeons receive the impression that patients suffering with heart disease are especially safe. I believe they are safe because they are considered especially unsafe."

Read at the first annual meeting of the Minnesota State Association of Nurse Anesthetists, June 20th, 1935, at Duluth, Minn.

ANESTHESIA PROBLEMS

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The facts that shall be brought out in this paper are mainly old and familiar and there will be no novelty in their presentation. The profundities of anesthetic problems concerning chemical, biochemical, medico-legal and other aspects will be avoided. The fundamental truths of anesthesiology will be discussed. These may appear trite and commonplace, but in my judgment they form the major consideration in every anesthesia. Eternal vigilance is the price of safety.

The comments in this discussion are directed to the nurse anesthetist. The nurse anesthetist in recent years has been given responsibilities which require her to be especially well informed. My subject is too large for a single paper, so only a few points of special interest to the nurse anesthetist will be mentioned. For convenience of study I have divided the problems of anesthesia into four headings:—

First, anesthetic problems which are known prior to operation, such as:

(a) those affecting elective surgical cases
(b) those affecting emergency surgical cases.

Second, those problems affecting the choice of the anesthetic.

Third, anesthetic problems affecting the safety of the patient during the administration of the anesthetic, occurring with the agents such as: ether, ethylene, nitrous oxide, spinal, et cetera, and problems relative to circulatory depression.

Fourth, those problems affecting the patient during the first twenty-four hours post-operative, such as headache, nausea, vomiting, pulmonary complications, mental attitude.

The elective surgical cases may be divided into four classes, namely:

(a) Normal patient plus slight operation
(b) Normal patient plus serious operation
(c) Serious pathology plus dangerous operation
(d) Patient in immediate danger as a result of the surgery or from some complication.

Emergency cases unprepared for surgical procedures, such as ruptured ectopic gestation, perforated peptic ulcer, intestinal obstruction, or more usually, acute gangrenous appendix, present the hardest problems, especially if the surgeon demands deep relaxation, and the patient has been considerably narcotized before hospitalization. Ether by the open drop method may not be the anesthetic of choice with such preliminary medication. Gas alone is difficult, but ethylene-ether with the use of carbon dioxide has given good results, as well as spinal when it is not contraindicated.

Many of the accident cases which come in with minor injuries and fractures insist on having gas. These patients are usually excited, have food in the stomach, and may be in a state of shock. In this instance the first problem is to carry the patient deep enough to abolish nausea. The second problem is to bring about a rapid recovery from the anesthetic by hyperventilation with 10 per cent carbon dioxide and 90 per cent oxygen, thereby quickly restoring the reflexes which would prevent the patient from aspirating any particle of undigested food.

In my observations made under the direction of three very able anesthetists at the Mayo Clinic, of the methods and choice of anesthetics for a great variety of surgical cases, and from my own experience since I have been away from the Clinic, I find that for operations on the brain, if the patient is in fair physical condition, ether by the open drop method has been satisfactory, except for operations on the cerebellum, where the intratracheal method has a definite advantage, as it facilitates better ventilation. For operations about the face, if the operation is to be a plastic, the anesthetist is in the way of the operative field, consequently the intratracheal method with gas or gas-ether anesthesia is indicated. Operations on the eyes are usually done under local. This is also true of operations on the nose and adult tonsillectomies, with ether by the open drop method for children. Operations on the thyroid gland are usually most satisfactory under ethylene or local infiltration and ethylene. Operations on the submental-submaxillary glands of the neck, or thyro-

glossal cysts, may be done satisfactorily with open drop ether or cervical block anesthesia, if sufficient preliminary medication has been given. I find ethylene satisfactory when it is not contraindicated because of its inflammability. In radical breast operations where quiet breathing is desirable, ethylene and ether, or ether by the open drop method, or alone or in combination by the intratracheal method, give very good results.

For operations within the thorax, such as thoracoplasty, ethylene or nitrous oxide seems satisfactory; however, many advocate the routine use of local anesthesia. For operations in which the pleura is opened, the intratracheal method of administering a gas, with or without ether, following some preliminary medication, is usually essential. Operations for diaphragmatic hernia also are done under this method advantageously. In upper abdominal operations in which relaxation is necessary, ether by the open drop method or gas-ether, is advisable but when pulmonary complications are present, or if the patient is a very bad surgical risk, spinal, or local infiltration supplemented with ethylene are the anesthetics of choice. Lower abdominal operations may be satisfactory for most surgeons under ethylene anesthesia, or with ethylene-ether. Some surgeons prefer spinal for herniotomy operations. Operations on the perineum may be done under gas, and the female patient usually prefers to be asleep during such operations. Operations on the lower extremities may be done under almost any kind of anesthetic. I have found ethylene particularly adapted to obstetrical procedures.

A routine anesthetic for a great variety of cases is not only unsatisfactory, but dangerous. In my studies under Doctor Lundy I was taught that "The choice of an anesthetic is best made by following a definite plan. The preliminary considerations to guide the choice are:

(1) The mental and physical condition of the patient.
(2) Is relaxation necessary?
(3) Is quiet breathing necessary?
(4) Is quick recovery of the reflexes desirable or necessary?
(5) Is a given agent or method likely to produce immediate or delayed untoward results? The use of each agent is limited by certain effects, and these effects must be borne in mind. This applies to preliminary medication as well."

Doctor Lundy in his paper on "Various Anesthetics and Certain Methods of Their Administration, Indications and Contraindications," says that "Ether, the most extensively used of all anesthetic agents in the past, is one of the most reliable available agents. The physiological effect of this agent depends to some extent on its method of administration. The most commonly used is the open drop method. Usually results with this method are uniformly satisfactory, if the concentration of the vapor administered is not sufficient to depress the respiratory center. The closed method of administering ether is facilitated by the admixture of anesthetic gases, and of oxygen and carbon dioxide. It is best to establish anesthesia with low concentration of ether by means of deep breathing through the period of induction, and by using the gases not only as vehicles for ether, but as synergists in obtaining anesthesia. It is essential in this method that the percentage of oxygen be sufficient adequately to maintain metabolism. Good results have been obtained from hyper-

ventilation of the lungs with a mixture of carbon dioxide 5 per cent and of oxygen 95 per cent, following anesthesia by inhalation of ether.

"Ethylene when its inflammability does not contraindicate its use, is fully as valuable, if not more valuable, than nitrous oxide. Twice as much oxygen may be administered with ethylene as with nitrous oxide and equivalent anesthesia, and also considerable relaxation can be obtained.

"Breathing is not particularly quiet and reflexes are recovered easily. Immediate and remote untoward results should not occur except through the inflammability of the agent. With both nitrous oxide and ethylene, it is often advantageous to administer small amounts of ether. With either nitrous oxide or ethylene, preliminary medication is important.

"A mixture of oxygen and ethylene is not particularly disagreeable to inhale. Nausea and vomiting not uncommonly follow ethylene anesthesia, but are not nearly as severe as after ether, although more distressing than after nitrous oxide. Anoxemia is the most frequent complication in ethylene as well as in nitrous oxide anesthesia, and it may bring the patient to a critical point. Ether may be added to maintain the desired degree of anesthesia, when fairly high percentage of oxygen is necessary in the mixture. The amount of oxygen to be used in the anesthetic mixture is often inversely proportionate to the percentage of hemoglobin; and in some cases where the reported percentage of hemoglobin is high and the patient requires an unusual amount of oxygen, the correctness of the estimated percentage of hemoglobin might well be questioned. The knowledge of the percentage of hemoglobin is a valuable asset to the anesthetist.

"Nitrous oxide is widely used, and is a valuable agent, particularly because it is not inflammable, is not unpleasant to inhale, and is not irritating to the lungs. It is especially useful for short minor operations, and for operations in which relaxation is not necessary. Adequate preliminary medication should be given in administration of this agent. A mixture of nitrous oxide and oxygen will not produce relaxation if anoxemia is avoided. However, not always satisfactory when used alone, nitrous oxide is a good vehicle, and is effective when used with ether after morphine, and is preferred to ethylene in some localities particularly because it is not inflammable.

"Carbon dioxide is accepted now as a very valuable agent whenever a gas machine is used, as one then has a means of controlling the patient's respiration during and after operation. We find by increasing the depth of respiration there is a better ventilation of the lungs, and therefore less evidence of anoxemia than there might be otherwise. At the same time absorption of the ether is doubled so that half the usual quantity of ether is sufficient.

"Carbon dioxide acts as a prophylactic to prevent the patient from straining or vomiting, if it is added to the anesthetic mixture at the first sign that respirations are inadequate or irregular. This measure is often very valuable during spinal anesthesia when it becomes necessary to handle the viscera, or make traction on the mesentery."

Spinal in selected cases, where it is not contraindicated by debility, hypotension, marked cardiovascular disease, or disease of the central

nervous system, and when handled by a physician experienced in its use, is invaluable. Usually the nurse anesthetist is asked to check the blood pressure and the condition of the patient, and at the same time keep the patient comfortable. In spinal anesthesia shallow respiration is not an infrequent complication, accompanied by an ashen gray type of cyanosis, and nausea. Prompt benefit is obtained by the use of oxygen and carbon dioxide. The patient with shallow respiration is usually more comfortable breathing oxygen during the entire operation.

It was customary at the Mayo Clinic during the time I was employed on the anesthesia staff, to record the blood pressure of operations under local anesthesia, and in all major operations under general anesthesia. I find that the blood pressure is invaluable in giving the anesthetist an early warning of any circulatory depression, especially in spinal anesthesia. The degrees of circulatory depression may be divided into three stages:

(1) 15 per cent increase in pulse rate
(2) 25 per cent increase in pulse rate plus 10 to 25 per cent decrease in blood pressure
(3) Pulse rate of 100 and ascending, plus progressive falling blood pressure reaching 80 systolic and 20 or less pulse pressure.

High pulse rate and low pulse pressure is usually a warning of danger.

The anesthetist should at all times know the exact condition of the patient. The keeping of an accurate anesthetic record is important. It is the exact answer to any question of the surgeon throughout the operation. These records can be used in teaching the principles of anesthesia to students. Throughout my training I was taught to keep an accurate record.

The anesthetist should also follow each patient post-operatively as to time of reacting, headache, nausea, vomiting, pulmonary complications, and whether or not the anesthetic was pleasant to take. Invaluable information is gained by a close follow-up of the anesthesia for a period of at least 24 hours.

Read at the meeting of the Tennessee State Nurse Anesthetists Association, Memphis, Tenn., February, 1933.

QUESTION:

What was the outstanding accomplishment in your department during the year 1935?

REPLIES:

The outstanding accomplishment in the Department of Anesthesia at the New Haven Hospital during the past year has been the opportunity afforded us of enlarging our group of elective anesthetic drugs by the inclusion of cyclopropane, vinethene and evipal soluble.

While not intending to try out all new fads, we believe it is quite worth while to give serious consideration to the possibility for a choice, or combination, of a variety of drugs which have been proven reasonably

safe anesthetics. In this way we can hope to more nearly approach ideal anesthesia for the individual patient under varying conditions, and for the surgical operation to be considered.

ALICE M. HUNT, *Anesthetist-in-Chief*,
New Haven Hospital, New Haven, Conn.

Vanderbilt University Hospital has used endotracheal inhalation anesthesia for several years, although it was not established as a routine in suitable cases until 1935. With the increasing popularity of this method, the nurse anesthetist is going to find it necessary to be able to do a skillful intubation. The one difficulty is to be able to do a quick intubation, which one will never accomplish if only rarely used. After an anesthetic is once started it is by far the easiest method to handle.

It should not be thought of as a method to be used only in large clinics where thoracic and plastic surgery is done, but as an emergency measure for all operating rooms, because it affords an adequate air-way for artificial respiration and oxygen insufflation.

You may be interested to know how this method was established at Vanderbilt Hospital. Through the cooperation of the ear, eye, nose and throat clinic endotracheal anesthesias were administered to a large number of routine tonsillectomy patients. At the outset valuable assistance and instruction was given by the otolaryngologist in charge. After becoming sufficiently familiar with the technique in children, experience with adults was gained on surgical cases at the end of long anesthesias, when there was still relaxation sufficient to permit exposure.

As a beginner, always have a well relaxed throat, under ether anesthesia. You will find that men with their strong jaws need a fairly deep anesthesia—the negro man is especially difficult. Women and children can be intubated under gas induction with just enough ether added to relax the throat for a few minutes.

The necessary equipment consists of any modern gas machine, catheter adapter with exhaling valve, set of catheters, a direct vision laryngoscope and a respiratory manometer. The initial cost may be $60.00 or more, but the upkeep is very little—new batteries and bulbs for the laryngoscope and new catheters.

At this institution the Flagg laryngoscope and Magill catheters, without stilettes, are used. These catheters are very durable and stand boiling, but may be sterilized by soaking in alcohol, as boiling will tend to soften the rubber. With the carbon dioxide absorption technique, use the Waters inflatable cuff, which allows a more satisfactory closed circle and prohibits the entry of blood or mucus into the trachea.

SUMMARY

It will be necessary in the future for the nurse anesthetist to be able to do a skillful intubation—not only in order to use the method in suitable cases, but as an emergency measure so that artificial respiration by positive ventilation may be given. Experience is quite necessary and it can be obtained in the tonsil clinic and with the major cases while under anesthesia.

Adults are more difficult than children—men more difficult than women.

There is an expense to the initial equipment but upkeep is very little.

HATTIE VICKERS, *Chief Anesthetist*,
Vanderbilt University Hospital,
Nashville, Tenn.

During the past year, we feel that our patients' convalescence following anesthesia has been greatly benefited by the periodic inhalation of a 10 per cent mixture of carbon dioxide for twenty-four to ninety hours, according to the duration and depth of narcosis.

Such complications as atelectasis, lung collapse (partial or complete), bronchial obstruction from mucus plugs, and pneumonia have been greatly reduced by thorough expansion of the lungs with a carbon dioxide mixture for about three to five minutes, and the subsequent periodic treatment, after spinal as well as general anesthesia. The results have so impressed us that we have added to our anesthetic apparatus a special machine for administering the carbon dioxide mixture, which can be easily transported by the anesthetist to any part of the hospital. The apparatus is equipped with the "Ohio" face inhaler, which includes an automatic inlet valve to prevent rebreathing. A soft inflated rubber cushion around the edge of the inhaler keeps out the air when the maximum concentration is desired.

MARY E. KOENIG, *Chief Anesthetist*,
Charity Hospital, New Orleans, La.

At the Cleveland Clinic during the past year I have had the opportunity to observe the surgical treatment of hypertension by denervation of the adrenal glands and division of the major and minor splanchnic nerves. The question of a suitable anesthetic was of considerable importance, therefore the following notes were made regarding types of anesthesia which were employed.

Local Anesthesia
- Pulse—slight increase in rate
- Blood pressure—no marked change
- Respirations—good
- Relaxation—not sufficient
- Morale—poor.

Spinal Anesthesia
- Pulse—not much change in rate, but volume poor due to drop in blood pressure
- Blood pressure—sudden drop
- Respirations—labored; color poor
- Relaxation—very good.

General Anesthesia—Nitrous oxide plus oxygen plus ether
- Pulse—increase in rate during induction, but not to a disturbing degree
- Blood pressure—an increase of from 10 to 20 millimeters during induction, then a drop of from 20 to 30 millimeters.

A novocaine block of the peri-adrenal region at this point stabilizes the blood pressure during the manipulation and denervation of the gland.

Respirations—good

Relaxation—sufficient for the surgical procedures.

Conclusion

In a survey of several hundred charts and following direct observation, it would seem that general anesthesia is the method of choice for denervation of the adrenal glands and division of major and minor splanchnics in cases of hypertension.

Lou E. Adams, *Chief Anesthetist*
Cleveland Clinic Hospital,
Cleveland, Ohio.

A Brief Outline of the Use of Cyclopropane at Ravenswood Hospital in 1935

1. Complete anesthesia—Cyclopropane produces unconsciousness in from forty seconds to four minutes. It has a pleasant odor and is easy to inhale when properly administered. Special equipment is used, with gauges that are dependable for the minimal flow of gases, with soda lime attachment to control carbon dioxide and, above all, equipment that will not leak.

2. Easy and more rapid induction—Most of the patients are given a premedication of morphine and atropine sulphate, or morphine sulphate and scopolamine, forty-five minutes before operation. When the surgeon is ready the breathing bag on the gas machine is filled almost to distention with oxygen. The patient is given a few inhalations of oxygen. The oxygen flow-meter is then regulated to 250 c.c. per minute, or the amount of oxygen necessary to keep the patient's color pink. Cyclopropane is allowed to flow into the breathing bag at the rate of 300 to 400 c.c. per minute for one to five minutes; then it is turned off from one to five minutes. Therefore, the average use of cyclopropane without ether for one hour of surgical procedure has been twenty-six minutes with flow not above 400 c.c. per minute and with ether, not to exceed five minutes, it has been not over twenty-three minutes, for one hour of surgical time. In 95 per cent of the cases, cyclopropane anesthesia was without ether; 5 per cent, with ether.

3. Better muscular relaxation—The relaxation is more complete with cyclopropane than with nitrous oxide or ethylene.

4. Fewer post-operative complications—In my brief experience, post-operative complications such as headache, nausea, dizziness, extreme thirst and backache have been less than with any other inhalation anesthetic.

My advice to all anesthetists is to pick their way carefully; cyclopropane is tricky and exceedingly potent. Much work remains to be done with regard to the pharmacological properties of this new gas.

Mae B. Cameron, *Chief Anesthetist*,
Ravenswood Hospital, Chicago, Ill.

In the Department of Anesthesia at The Johns Hopkins Hospital the outstanding accomplishment for the year 1935 was the progress made in anesthesia for thoracic surgery, with particular reference to the treatment of tumors of the lung and mediastinum, bronchiectasis, tuberculosis and asthma. Naturally, different methods in the administration of anesthetics have been employed. In the previous year, 1934, in only one case was the endotracheal technique used. For the remaining cases nitrous oxide-oxygen was administered in the usual manner. However, for all the cases in 1935 the endotracheal technique was employed and the following routine was observed:

The patient was given a hypodermic of ¼ grain of morphine and 1-100 grain of atropine three-quarters of an hour before the time of operation. Avertin was also used as a basal anesthetic in doses of 50 to 80 milligrams per kilo of body weight and was given about one-half hour previous to the operation. Nitrous oxide-oxygen was used as the supplementary anesthetic, with ether only in sufficient quantity to enable the anesthetist to introduce the tracheal tube. It is our experience that this type of case requires a very high percentage of oxygen during the operation and for this reason it is deemed advisable to employ a basal anesthetic such as avertin.

The results obtained in 1935 were excellent. The operative time varied from twenty minutes to four hours, and the patients remained in good condition throughout the operation and of good color, showing not the slightest evidence of anoxemia.

Olive L. Berger, *Chief Anesthetist*,
The Johns Hopkins Hospital,
Baltimore, Md.

We have devoted the major part of our time during the past year to improving and expanding our instruction for student anesthetists. In this we have been greatly aided by the curriculum advocated by the National Association of Nurse Anesthetists. This improvement we feel is the oustanding accomplishment in our department for the year 1935.

Mary H. Muller, *Chief Anesthetist*,
Duke University Hospital, Durham, N. C.

QUESTION:

Sent In By One Of The Members

Whose duty is it to see that the patient is placed in the proper position on the operating table—the nurse or the anesthetist?

REPLIES:

It is the duty of the operating supervisor or one of her graduate assistants to place the patient in all positions. Requests or suggestions by the anesthetist are always accepted and immediately acted upon.

Eva M. Dickson, *Chief Anesthetist*,
Brooklyn Hospital, Brooklyn, N. Y.

The surgeon's first assistant is responsible for the position of the patient in the operating room. Of course an orderly or a nurse may put the patient in position but it must be approved by the surgeon's assistant.

OLIVE L. BERGER, *Chief Anesthetist*,
Johns Hopkins Hospital, Baltimore, Md.

The anesthetist and surgical supervisor share that duty, as occasionally the patient may move while going to sleep, which makes it necessary for the supervisor to do some readjusting.

MINA SPONHEIM,
Northwestern Hospital, Minneapolis, Minn.

It is the duty of the nurse to see that the patient is placed in the proper position on the operating table. However, it is the anesthetist's duty to see that the position in no way interferes with the administration of the anesthetic.

MYRN E. MOMEYER, *Chief Anesthetist*,
St. Luke's Hospital, Cleveland, Ohio

Placing patients in unusual positions in the operating room is first the duty of the anesthetist, who follows the suggestions of the surgeon and first assistant. This is the duty of the anesthetist rather than of the nurse so that there may be no possibility of obstruction of respiration at any time during the operative procedure.

MARY H. MULLER, *Chief Anesthetist*,
Duke University Hospital,
Durham, N. C.

At Strong Memorial Hospital, it is the nurse's duty. However, if the patient is in any position other than the dorsal the anesthetist is responsible to the extent that she must see that breathing is interfered with as little as possible.

MIRIAM G. SHUPP, *Chief Anesthetist*,
Strong Memorial Hospital,
Rochester, N. Y.

In Memoriam

SISTER M. ALEXANDRINE

1862 - 1936

There are people who by destiny of birth, choosing of high vocation and excellent traits of charater blend their lives with the purposes and growth of a country and institution, yet leave their individual imprint upon both.

To such belonged Sister Alexandrine, born Mary Jane Fitzgerald, daughter of Mr. and Mrs. Michael Fitzgerald, Painesville, Ohio pioneers, and grandniece of Colonel John Fitzgerald, aide-de-camp to George Washington in the American Revolution. At the unveiling of a tablet to her granduncle at Alexandria, Va., Sister Alexandrine was a guest of honor and after the ceremony was given audience with President Roosevelt.

Sister Alexandrine became a religieuse of the Order of Saint Augustine, which order originated in 1233 when a small group of young women established themselves in Arras, France for the purpose of devoting their lives to the sick poor, under the name of "Filles de Dieu." In 1430 the Bishop of Arras formed them into a religious congregation of the Sisters of Saint Augustine, consecrated to the service of the sick poor and the education of youth. From this time until about 1794 their Motherhouse, "The Meadow of St. Augustine," Arras, was the center of their activities. Forced to disperse by the French Revolution, the order was disbanded until 1814, when the five sisters who survived were authorized by their Bishop to resume their habit and renew their vows. The founders of this order in Cleveland in 1851 were direct descendants of these five nuns, thus linking historically the old and new worlds with bonds of service.

Sister Alexandrine entered the congregation of the Sisters of Charity of Saint Augustine July 15th, 1891. Her first work was at St. Vincent Orphanage for Boys, remaining there in the capacity of teacher until 1895. She was graduated as a nurse from St. Vincent Charity Hospital September 24th, 1900. As a graduate nurse she served there in the capacity of supervisor on different wards, and Treasurer of the hospital for six years. Her next appointment was as Superior of St. Ann's Maternity Hospital, where she remained until 1914.

In 1917 she became interested in anesthesia and after study was anesthetist at Charity Hospital and later at St. John's Hospital. A skillful etherizer, Sister Alexandrine took up the study of gas anesthesia, graduating from the Lakeside School of Anesthesia in 1919. This willingness to again become a student in order to have more to give, was characteristic of Sister Alexandrine. She was always intensely interested in establishing and carrying out newer methods which would benefit the patient.

Next to her profound sense of duty to and love for the sick, came her interest in the profession. As charter member of the National Association of Nurse Anesthetists, and First Vice-President of the Ohio State

Association of Nurse Anesthetists, she showed a very special desire to further the interests of this group. Her faith in our ability to achieve our goal was inspiring and her counsels always wise.

Forced through ill health to give up active work, Sister Alexandrine remained a valued and loved resident of St. Augustine Convent, Lakewood, until her death January 10th, 1936.

Those of us who knew and loved her, cherish the remembrance of a steadfast, sincere friendship which greatly enriched our lives. To those who did not know her, we give our memory of a tall and gracious woman, whose kindly manners won the hearts of people. A gentlewoman of the old school, yet with keen appreciation of the value of progress and fine sense of values—putting first things first. One whose ideals of service deeply planted in spiritual soil—blossomed with daily acts of love and mercy through her long and useful life.

AGATHA HODGINS

COMING MEETINGS

NEW YORK

The third annual meeting of the New York State Association of Nurse Anesthetists will be held in Buffalo, N. Y., May 21st and 22nd, 1936, in conjunction with the New York State Hospital Association. Headquarters at the Hotel Statler. For further information write Miss Cora McKay, President, Albany Hospital, Albany, N. Y., or Miss Hazel Blanchard, Secretary-Treasurer, 1910 Seventh Avenue, Troy, N. Y.

PROGRAM

ANNUAL MEETING NEW YORK ASSOCIATION

May 21st and 22nd, 1936
Buffalo, N. Y.

Thursday, May 21st

9.00— 9.30 Registration—Hotel Statler, Mezzanine

10.00—12.00 Clinic—Buffalo General Hospital, 100 High Street
Marshall Clinton, M.D.,
Professor of Surgery, University of Buffalo
Walter L. Machemer, M.D.,
Assistant Professor of Surgery,
University of Buffalo

1.00 Luncheon—Hotel Statler, Fillmore Room
Address of Welcome
Cora McKay
President, New York State Association of Nurse Anesthetists
"Anesthesia in Neurosurgery"
Ida M. Edwards
Strong Memorial Hospital, Rochester, N. Y.

"Anesthesia in Thoracic Surgery"
Martha Ziegler,
Kings County Hospital, Brooklyn, N. Y.
"Organization and Management of an Anesthetic Department"
Clara Bieber,
Woman's Hospital, New York City
"Cyclopropane Anesthesia"
Frances Hess,
Long Island College Hospital, Brooklyn, N. Y.

4:30 "Value of Carbon Dioxide in Post-operative Cases"
Thew Wright, M.D.,
Professor of Surgery, University of Buffalo,
Chief Surgeon, Children's Hospital.

7:00 Banquet—Hotel Statler

Friday, May 22nd

9:15 A.M. General Session—Hotel Statler, Fillmore Room
Greetings
Mr. James Norris,
President, New York State Hospital Association

9.30 Address
Hilda Salomon,
President, Nat'l Association of Nurse Anesthetists

9.45 "The Nurse Anesthetist and Her Future"
Walter Goodale, M.D.,
Superintendent, Buffalo City Hospital

10.15 "Anesthesia in Gynecology"
James E. King, M.D.,
Professor of Gynecology, University of Buffalo

10.45—12.45 Business Meeting

2.00 P.M. General Session—
"Justification of the Nurse Anesthetist"
Harry R. Trick, M.D.,
Assistant Professor of Surgery, University of Buffalo

2.15 "Anesthesia in Obstetrics"
Daniel E. Stedem, M.D.,
Millard Fillmore Hospital

3.00 Trip to Niagara Falls — Tea at the Falls

MISSISSIPPI

An organization meeting of the Mississippi anesthetists will be held May 4th at Greenville, Miss.

For further information write Miss Lola Allen, Box 390, Greenville, Miss.

MEETINGS OF STATE ORGANIZATIONS

TEXAS

The first annual meeting of the Texas Association of Nurse Anesthetists was held in Dallas March 6th and 7th, 1936, in conjunction with the Texas Hospital Association. Thirty-three members were present.

Among the speakers were Mr. Robert Jolly, Dr. Malcolm T. MacEachern and Dr. Bert W. Caldwell.

The following officers were elected for the year 1936:

President, Dorothy M. Hoadley
Vice-President, Margaret C. Thomson
Secretary-Treasurer, Ora Lee Mercer.

A resolution was approved to apply for affiliation in the State Division of the National Association of Nurse Anesthetists.

CALIFORNIA

The fourth regular meeting of the California Association of Nurse Anesthetists was held Tuesday, February 21st, 1936, at Providence Hospital, Oakland, Calif. Twenty members were present.

Following a short talk by the President, Myra B. Quarles, Dr. C. A. Dukes, former Vice-President of the American College of Surgeons and Chairman of the Cancer Committee of the State of California, gave a very interesting lecture on the surgical treatment of cancer, with slides of many cases before and after surgery. Dr. Charles Hudson, D.D.S., read a paper on the advantages of the carbon dioxide absorption technique.

The second annual meeting of the California Association was held at San Francisco Hospital, San Francisco, March 3rd, 1936. Nineteen members were present.

The following officers were re-elected for the year 1936-37:

President, Myra B. Quarles
Vice-President, Margaret McCoppin
Secretary-Treasurer, Martha M. Guptill
Trustees: May Malamphy, Sarah Rausch, Vyevene Ellis.

The guest speaker, Dr. Carlton Mathewson, of the staff of the San Francisco Hospital, gave a very interesting and delightful account of his experiences while working and studying at the university clinics of Scotland, England and Germany, with some especially interesting sidelights on anesthesia.

The membership of the California Association to date is fifty-nine.

MINNESOTA

The Minnesota anesthetists have met the last Tuesday of each month, with an average attendance of thirty-two. The following lectures have been given:

Dental Anesthesia—Dr. S. Ziegler
Preparing Patients for Anesthesia—Dr. E. Hartley
Cardiac Cases in Relation to Anesthesia—Dr. S. H. Boyer
Diabetics in Anesthesia—Dr. F. J. Hirschboeck
Use of Cyclopropane—Dr. R. Knight
Anesthesia in Relation to Heart and Pulse—Dr. J. F. Briggs
The Perfect Anesthetist—Dr. A. W. Hoaglund
Intratracheal Anesthesia—Dr. G. W. Gardner
Spinal Anesthesia—Dr. Wm. Carroll

MINNESOTA (Continued)

TREASURER'S REPORT FOR 1935:

RECEIPTS		
Initiation Fees	$ 27.00	
Dues	147.00	
Interest	.09	$174.09
DISBURSEMENTS		
Printing of cards and by-laws	28.65	
Treasurer's and Secretary's books	5.70	
Convention expense	10.00	
Telegrams and postage	4.18	
Transfer of dues to National	94.50	
Cashier checks	.30	143.33
Cash on hand January 1, 1936		$ 30.76

HELEN BAGGOT,
Treasurer.

TENNESSEE

The third annual meeting of the Tennessee State Nurse Anesthetists' Association was held in Memphis February 12th, 1936, at the Peabody Hotel, in conjunction with the Mid-South Post-Graduate Nurse Anesthetist Assembly.

The following officers were elected for the year 1936:

President, Jennie Houser
Vice-President, Gertrude Alexander Troster
Secretary-Treasurer, Jean O'Brien

A resolution was passed approving application for affiliation in the State Division of the National Association of Nurse Anesthetists.

The fourth annual meeting of the National Association of Nurse Anesthetists will be held in Cleveland, Ohio, September 29th and 30th and October 1st, 1936, in conjunction with the American Hospital Association.

Hotel headquarters, Hotel Carter, 1012 Prospect Avenue. Hotel reservations can be made through National Headquarters, 2073 Adelbert Road, Cleveland, Ohio.

Convention visitors will be especially fortunate in being able to attend the Great Lakes Exposition — Cleveland, June 27th to October 4th, 1936.

REPORT OF OHIO MEETING

The third annual meeting of the Ohio Nurse Anesthetists' Association, which was held in Columbus April 15th and 16th, 1936, was well attended, the program was interesting, and much enthusiasm was developed among the Ohio anesthetists which will help to make the National convention, to be held in Cleveland this fall, a real success.

The following took part in the program.

"Pre-operative Medication in Surgery and Obstetrics"
Leona Maxwell, Akron, Ohio

"Importance of Organization"
Hilda R. Salomon, President National Association of Nurse Anesthetists (See page 119)

"The Ideal Anesthetist"
Sister John Edward Kaiser, Dayton, Ohio

"Anesthesia and the Surgeon"
Edwin J. Stedem, M. D., Columbus, Ohio

"Organization and Management of an Anesthesia Department"
A. E. Hardgrove, Assistant Executive Secretary, American Hospital Association

"Respiration and Its Importance in Anesthesia"
Fred A. Hitchcock, M.D., Department of Physiology, Ohio State University, Columbus, Ohio

An interesting clinic was arranged at the University Hospital by Miss Emilie Kaiser, Chairman of the Local Arrangements Committee.

The following officers were elected for the year 1936-37:

President, Lucy E. Richards
First Vice-President, Emilie Kaiser
Second Vice-President, Sister John Edward Kaiser
Secretary-Treasurer, Marian Hollister
Trustee, Gladys M. Bolton

In recognition of distinguished service rendered and valuable assistance given the Ohio organization, a recommendation was made by the Board of Trustees of the Ohio Association that Mrs. Gertrude Fife be made an honorary member of the Ohio Nurse Anesthetists' Association. The resolution carried unanimously.

REPORT OF TREASURER

Statement of Cash Receipts and Disbursements
for the year ended March 31, 1936

Balance April 1st, 1935		$138.90
Receipts		
Dues—Active members—paid direct	$270.00	
—Associate members—paid direct	10.00	
—Active members—received from National Association	47.50	
Miscellaneous	2.50	330.00
		$468.90
Disbursements		
Transfers to National Association	$140.00	
Convention Expense	28.95	
Traveling Expense	29.14	
Auditing Expense	12.50	
Stationery, Stamps and Telegrams	11.67	222.26
Balance, March 31st, 1936, on deposit in the Euclid-Mayfield office of The Cleveland Trust Company		$246.64

MARIAN HOLLISTER,
Secretary-Treasurer

IMPORTANCE OF ORGANIZATION

HILDA R. SALOMON
President of the National Association of Nurse Anesthetists

In the minds of some there seems to linger a doubt as to the value of professional organizations such as ours. In the time allotted I shall endeavor to present a few of the reasons which to me are irrefutable and which as nurse anesthetists make our association the keystone of our group.

From time immemorial it has been the custom of mankind to dwell together in villages, towns and cities. This is undoubtedly due to an innate desire for protection and power. Even animals recognize the advantage of traveling and living in herds or flocks. This instinct permeates *all* life. In modern times when the smaller groups have grown to very large proportions, although the individuals therein, as the result of centuries of progress, have become quite dissimilar, we still find mankind associating on the basis of similarity in education, professional pursuits, recreational desires or political endeavors. Thus there exist today in practically every community organizations, clubs, leagues or associations, which while considered modern are traceable to the earliest eras of history.

There is the same value in organization today as in the days when the tribe or clan banded together, though the power gained in modern times has a different meaning and application from that of centuries ago. Particularly is this true in the grouping of intellectual people. Theirs is the power of mind, not of might. To study and work alone is good to a certain point but beyond that, the student or professional man or woman gathers strength and power by the interchange of ideas and the discussion of varied phases of his work with others engaged along similar lines. To the outside world he may be a valuable individual, but if he be a member of a group which not only receives him as a coworker but recognizes his professional efforts as achievements, his power and prestige grow by leaps and bounds.

Organization meetings are always educational, though that fact may not be immediately recognized. The mere contact with others who think along the lines of our endeavors stimulates thinking and is truly educational, and much is also gained by "talking shop" with those whose objectives are identical with ours. The combination cannot fail to be provocative of growth and development and there is no more fertile field for this growth than is found in the modern organization. Again, there is the practical value of organization. The application of knowledge gained through education is the real measuring stick of one's worth in this world and the actual working out of this knowledge can receive no greater impetus than through the contacts with fellow workers. Let us be more specific. In the case of our profession it has been demonstrated many times that the anesthetist who tries to stand alone, who refuses to join hands with others doing the same work, who neither gives of her experience nor is willing to listen to others—invariably loses out in the long run.

The importance of the anesthetist looms large not only in the mind of the surgeon but equally as great, if not greater, in the mind of the patient. The latter, generally ignorant of the real work of the surgeon, is

usually fearful and nervous. The idea of being operated upon is sufficient to upset the equilibrium, but even greater is the fear of lapsing into unconsciousness. The anesthtist must have a calming and soothing manner and give the reassurance to the patient that after the anesthetic wears off he surely will "come back." This dread of not coming back is greater many times than the fear of the actual operation. It behooves the anesthetist therefore not only to be skillful but to have the confidence of her patient, as well as the surgeon with whom she works. Her reputation as a good anesthetist is heralded to the outside world by her grateful patients—many seeking the attendance of this one or that one and refusing the ministrations of others.

How can you gain this reputation as a good anesthetist? Naturally the first essential is to know your work and be fitted for it. But above all else you must continue to study, to learn, to discuss, to help others by suggestion and in turn be helped yourself. You must demonstrate to your hospital, your surgeon and your patients that you are fully informed on your subject and able to carry on in the very best and most accepted manner. You must let them know that you are not working alone, perhaps groping for results, but that you are reaching out into every avenue in order to increase your efficiency, in your effort to aid the suffering.

Where can you find greater opportunity to gain all these objectives than in organizations of this kind? The National Association of Nurse Anesthetists means much to the individual and to the profession. There should also be a State association wherever it is possible and all State divisions should be affiliated with the National, which can so well guide and correlate activities. There *is* power in numbers, there *is* strength in organization. There is prestige gained by affiliation with such organizations and there is the resulting increased recognition by both professional and laymen through the publicity given to the continuous activities of our group.

Undoubtedly I have omitted mentioning all of the values to be gained by organizations such as ours. In the time allotted it is not possible to touch on them all, but I trust that I have brought to your attention some of the salient reasons for us as anesthetists to band together in smaller groups and then to become a vital part of that larger guiding group, the National Association of Nurse Anesthetists.

There is one benefit in belonging to the National organization which cannot be omitted. I refer to the National Bulletin. Not only does it embody the high aims and ideals of our profession but it contains instruction in the newer and better methods, and to quote from our former President: "The magazine has helped to establish a spirit of friendship among our members and has been the official organ of communication." It is carrying the message of our work not only to the hospitals and surgeons, but its influence will gradually filter through to others whose interest in our work will thereby be increased.

When another year rolls by may all the nurse anesthetists of our land have joined hands in upholding the National Association and by thus organizing as its constituents in their respective localities, bring to fruition the hope voiced in our Bulletin: "A year of progress and accomplishment and of happiness gained as a by-product of worthwhile endeavor."

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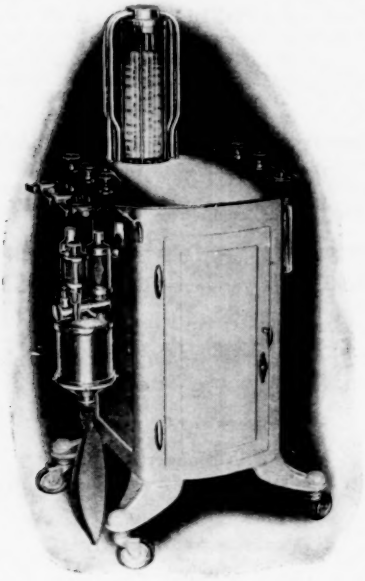

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